In the Claims

Please cancel claim 59 without prejudice and add new claims 60-79 as shown below in marked-up form, and in clean form on the sheets attached hereto pursuant to 37 C.F.R. 1.121(c)(3).

D'.

60. A system comprising:

an electric motor;

a prime mover for generating dc electrical power;

an inverter for converting the dc power to ac power, the ac power being supplied to the electric motor during motor operation; and

a controller for controlling the inverter to ramp up current of the ac power and ramp up frequency of the ac power during startup of the electric motor, the frequency being ramped up after the current has been ramped up, the current and the frequency being ramped up to reduce motor inrush current.

61. The system of claim 60, wherein the controller causes the inverter to ramp up the frequency according to a predetermined profile.

62. The system of claim 60, wherein the controller causes the inverter to vary the frequency of the ac power to track a process requirement.

63. The system of claim 60, wherein the controller causes the inverter to vary current of the ac power to track a process requirement.

64. The system of claim 60, wherein the prime mover includes a microturbine generator, the microturbine generator including a turbine for converting gaseous heat energy into mechanical energy; an electrical generator for converting the mechanical

energy produced by the turbine into electrical energy; and a rectifier coupled to an output of the electrical generator, an output of the rectifier providing the dc electrical power.

D' cont.

65. A system comprising:

an electric motor;

a prime mover for generating ac electrical power;

a dc link;

a first rectifier, coupled between the dc link and an output of the prime mover, for converting the ac power from the prime mover to dc power and supplying the dc power to the dc link;

a second rectifier adapted to convert backup ac power to dc power and directly place the converted backup power on the dc link in the event the prime mover fails;

an inverter, coupled to the dc link, for converting the dc power on the dc link to ac power, the ac power being supplied to the electric motor during motor operation; and

a controller for controlling the inverter to vary at least one of frequency and current of the ac power during operation of the electric motor.

66. A system comprising:

an electric motor;

a microturbine generator for generating dc electrical power, the microturbine generator including a turbine for converting gaseous heat energy into mechanical energy, an electrical generator for converting the mechanical energy produced by the turbine into electrical energy, and a rectifier having an input coupled to an output of the electrical generator, an output of the rectifier providing the dc power;

an inverter for converting the dc power to ac power, the ac power being supplied to the electric motor during motor

operation; and

a controller for controlling the inverter to vary at least one of frequency and current of the ac power during operation of the electric motor, wherein the controller also controls the microturbine generator.

D' cont.

67. A system comprising:

an electric motor;

a microturbine generator for generating dc electrical power, the microturbine generator including a turbine for converting gaseous heat energy into mechanical energy, an electrical generator for converting the mechanical energy produced by the turbine into electrical energy, a first rectifier having an input coupled to an output of the electrical generator, an output of the rectifier providing the dc power;

an inverter for converting the dc power to ac power, the ac power being supplied to the electric motor during motor operation; and

a controller for controlling the inverter to vary at least one of frequency and current of the ac power during operation of the electric motor;

wherein the inverter includes a dc power bus, a dc-to-ac converter coupled between the dc power bus and the electric motor, and a second rectifier having an input adapted to receive utility power and an output coupled to the dc bus, an output of the first rectifier also being coupled to the dc power bus.

68. A microturbine power generating system for operating an electric motor at variable speeds, the system comprising:

a turbine for converting gaseous heat energy into mechanical energy;

an electrical generator for converting the mechanical energy produced by the turbine into electrical energy;

a dc rectifier having an input coupled to an output of the electrical generator;

an inverter having an input coupled to an output of the rectifier, an output of the inverter providing ac power to the electric motor; and

D' cont.

a controller for causing the inverter to vary frequency and current of the ac power during operation of the motor, the controller causing the inverter to ramp up the current and then ramp up the frequency during motor startup to reduce motor inrush current.

69. The system of claim 68, wherein the controller causes the inverter to vary the current in response to process requirements during normal operation of the motor.

70. The system of claim 68, wherein the controller causes the inverter to vary the frequency in response to process requirements during normal operation of the motor.

71. The system of claim 68, wherein the controller also controls the operation of the turbine.

72. The system of claim 68, wherein the inverter includes a dc power bus, a dc-to-ac converter coupled between the dc power bus and the electric motor, and a second rectifier having an input adapted to receive utility power and an output coupled to the dc bus, an output of the first rectifier also being coupled to the dc power bus.

73. A method of operating an electric motor, the method comprising the steps of:

operating a prime mover proximate the motor to generate dc electrical power;

using an inverter to convert the dc power to ac power; supplying the ac power directly to the motor; and

controlling an inverter to vary current and frequency of the ac power during startup of the motor, the current being ramped up and then the frequency being ramped up during startup to reduce motor inrush current.

D' cont.

74. The method of claim 73, wherein the frequency is varied in response to process requirements during normal operation of the motor.

75. The method of claim 73, wherein current of the ac power is varied in response to process requirements during normal operation of the motor.

76. A method of operating an electric motor, the method comprising the steps of:

operating a prime mover proximate the motor to generate dc electrical power;

using an inverter to convert the dc power to ac power; supplying the ac power directly to the motor;

controlling an inverter to vary at least one of current and frequency of the ac power during operation of the motor; and

converting backup power to variable frequency ac power when the prime mover fails to generate the dc power.

77. A method of operating an electric motor, the method comprising the steps of:

operating a prime mover proximate the motor to generate dc electrical power;

using an inverter to convert the dc power to ac power; supplying the ac power directly to the motor;

controlling an inverter to vary at least one of current and

frequency of the ac power during operation of the motor; and

ganging other prime movers with the first prime mover.

D'

78. A method of operating an electric motor, the method comprising the steps of:

operating a microturbine generator proximate the motor to generate dc electrical power, wherein the microturbine generator is operated using a waste stream for fuel;

using an inverter to convert the dc power to ac power; supplying the ac power directly to the motor; and

controlling the inverter to vary at least one of current and frequency of the ac power during operation of the motor.

79. A system comprising:

an electric motor;

a prime mover for generating dc electrical power;

an inverter for converting the dc power to ac power, the ac power being supplied to the electric motor during motor operation; and

a controller for controlling the inverter to limit motor current during startup until the motor reaches a predetermined speed;

wherein the motor current is limited by ramping up frequency and controlling depth of inverter modulation.